It will be seen, then, that the continuity is practically perfect, both as regards the intensities of the lines and the presence in each star of the lines necessary for perfect continuity.

VIII. *Sequence of Spectra in Group III.*

The general sequence of spectra in passing from the earlier to the later species of Group III is as follows, as far as the observations have at present gone:—

(1.) The hydrogen lines are thin. D is thicker than *b*. The iron fluting is faint. 499, E, 5327, 540, 568, and 579 are thin. 546 and 558 are fairly thick.

(2.) The hydrogen lines are thicker. F, D, and *b* are equally thick. E, 5327, 540, 579, and 499 are much thicker, being nearly as strong as F. The iron fluting has gone.

(3.) The hydrogen lines are very much thicker than the other lines. D and *b* are equally thick. E is nearly as strong as *b*, while the other lines are fainter.

(4.) The hydrogen lines are very broad, while all the remaining lines are exceedingly faint.

Subsequent work will no doubt enable us to further divide these sub-groups into finer species.

II. "On the Magnetic Action of Displacement-currents in a Dielectric." By SILVANUS P. THOMPSON, D.Sc., B.A. Communicated by Professor G. CAREY FOSTER, F.R.S. Received February 19, 1889.

(Abstract.)

According to Maxwell's well-known views of electrostatic action, the variations of electric displacement which occur during the charge or discharge of a dielectric are to be regarded as equivalent to electric currents. No direct experimental proof of this point has hitherto been forthcoming. The author having calculated out on the assumption of the equivalence between displacement-currents and conduction-currents, what the effect would be of the charge or discharge of a condenser upon a delicately astatised needle placed near the edge of the condenser, concludes that the effects would be too delicate to be measurable. He therefore resorted to a different method based upon the principle that, if a closed curve be drawn around the flux of electrostatic displacement, the line-integral of the magnetising force, reckoned once round this closed curve, will at any instant be a measure of the rate of change in the electric displacement through the curve. Two forms of apparatus for realising this in an experi-

mental way were constructed. In the more satisfactory form of the apparatus an iron annulus surrounded by a coil of fine silk-covered copper wire is embedded in a layer of paraffin wax between two glass plates, and pieces of tinfoil are affixed on the outside surfaces of the plates to serve as the coatings of a condenser. The electric displacement passes through the aperture of the iron annulus. Any changes in that displacement set up magnetic forces acting round the iron annulus, which, thereby, is subjected to a varying magnetisation. The annulus in turn sets up induction currents in the copper wire that surrounds it, these induction currents being received and rendered audible in an ordinary telephone receiver. The condenser is connected to a Ruhmkorff coil which rapidly charges and discharges it. The sounds heard in the telephone receiver establish the reality of the magnetic action of the variations in the electric displacement.

The author points out that this device, which may be regarded as a new kind of proof plane for exploring varying electrostatic fields, is probably capable of other useful applications, such as the investigation of specific inductive capacities.

Presents, February 28, 1889.

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